

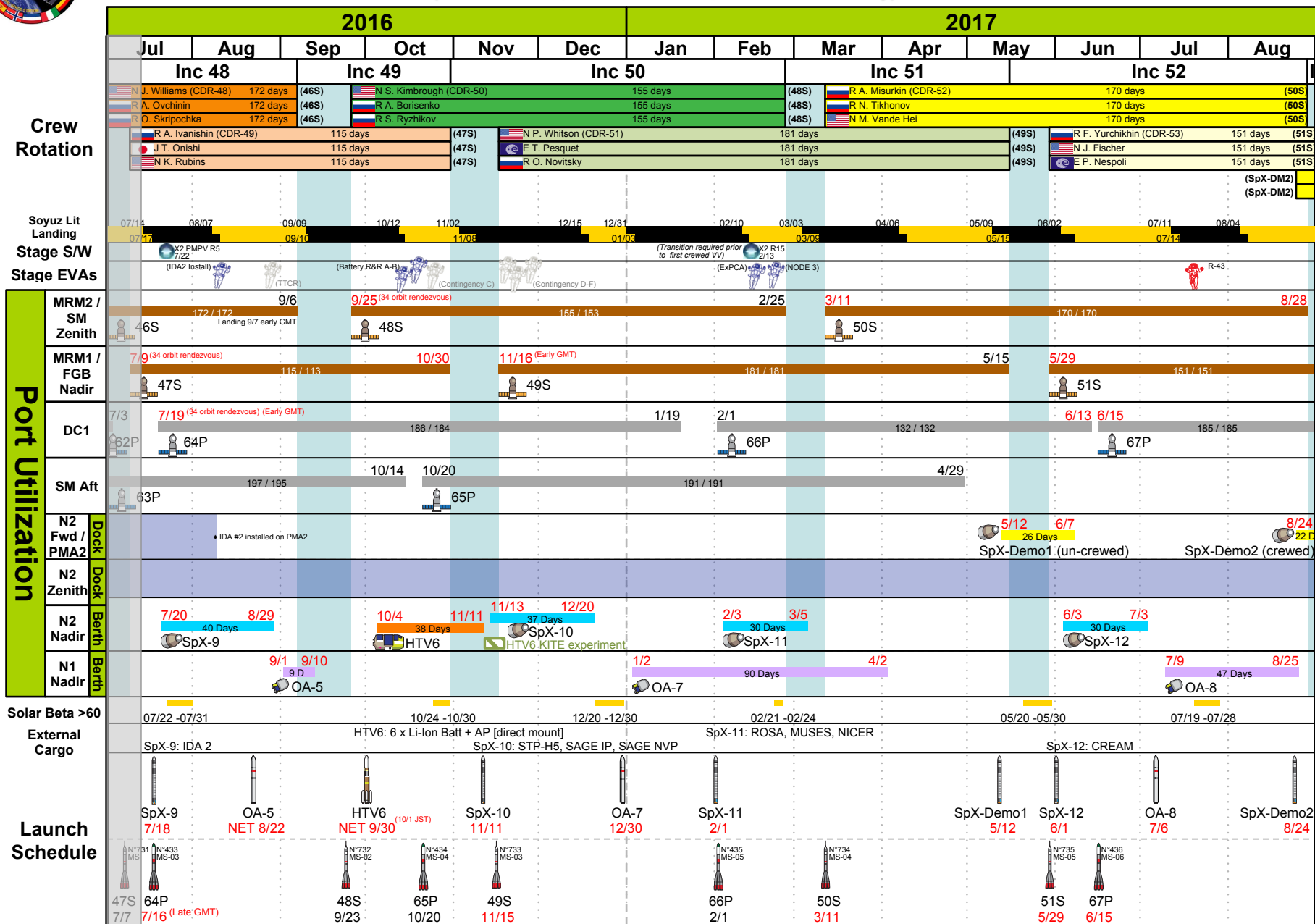
International Space Station Status



Sam Scimemi
Director, International Space Station
NASA Headquarters
July 2016



NASA: OC4/John Coggeshall
MAPI: OP/Randy Morgan
Chart Updated: July 07th, 2016





Increment 48 Overview: Crew



46S Dock 3/19/16
46S Undock 9/7/16



Oleg Skripochka
FE (R) – 46S



Jeff Williams
CDR (US) – 46S



Alexey Ovchinin
FE (R) – 46S



47S Dock 6/26/16
47S Undock 10/30/16



Anatoli Ivanishin
FE (R) – 47S
(CDR Inc. 49)



Takuya Onishi
FE (J) – 47S



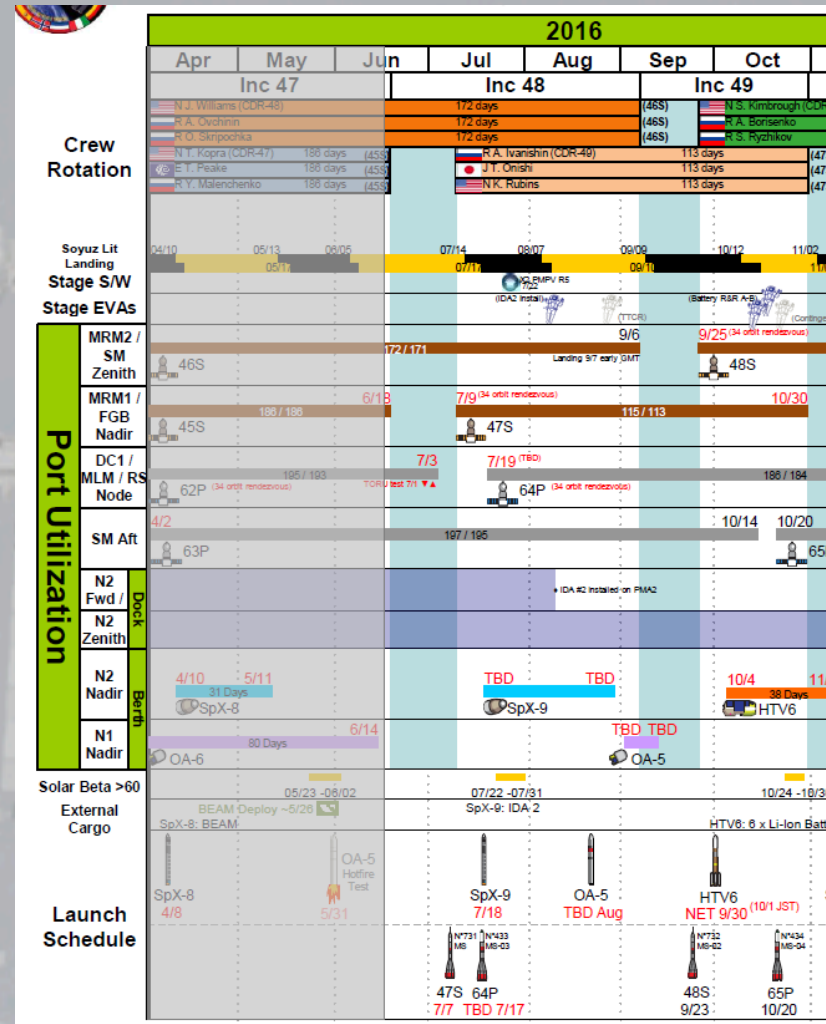
Kate Rubins
FE (US) – 47S



Increment 48 Overview: Major Stage Objectives



- Increment 48: 80 Days
 - Stage 48-3: 45S Undock to 47S Dock: 20 days
 - Stage 48-6: 47S Dock to 46S Undock: 60 days
 - EVAs
 - IDA 2 Install
 - TTCR Retract
 - Cargo vehicles:
 - SpX-9 Capture/Berth (7/20) / Unberth (8/29)
 - 62P Undock (7/3) / 64P Dock (7/19) at DC1 Nadir
 - OA-5 Arrival/Capture (NET Aug)
 - Science/Utilization:
 - JAXA Mouse Epigenetics
 - Fluid Shifts
 - Heart Cells
 - DNA Sequencer
 - Maintenance/Outfitting
 - External Wireless Cable Install
 - Lab MCA Troubleshooting
 - Software Transitions
 - PMPV R5



Per FPIP In Work, June 16, 2016



Increment 48 EVA Plan



- Contingency EVA Assignments
 - EV1 – Jeff Williams
 - EV2 – Takuya Onishi
 - IV/Robotics – Kathleen Rubins
- Support provided for EVAs in CSRD Chit 14317 (preliminary)

➤ IDA Installation EVA

- Perform final IDA2 cable routing.
- Perform IDA2 MLI removal.
- Perform IDA2 outfitting.
 - Install HEMI reflectors (2).
 - Install H-Fixture MLI.
 - Install PMA2 planar reflector cover.
 - Install PMA2 HEMI reflector cover.
- Perform EHDC installation on CP03 ETVCG.

➤ TTCR Restow EVA

- Perform retraction of TTCR, cinch, and install shroud.
- Perform tightening of Port AJIS struts 3, 2, and 1.
- Perform installation of EHDC on CP09 ETVCG.
- Perform CP09 luminaire R&R.
- Perform imagery of port SARJ at cover #17 location.

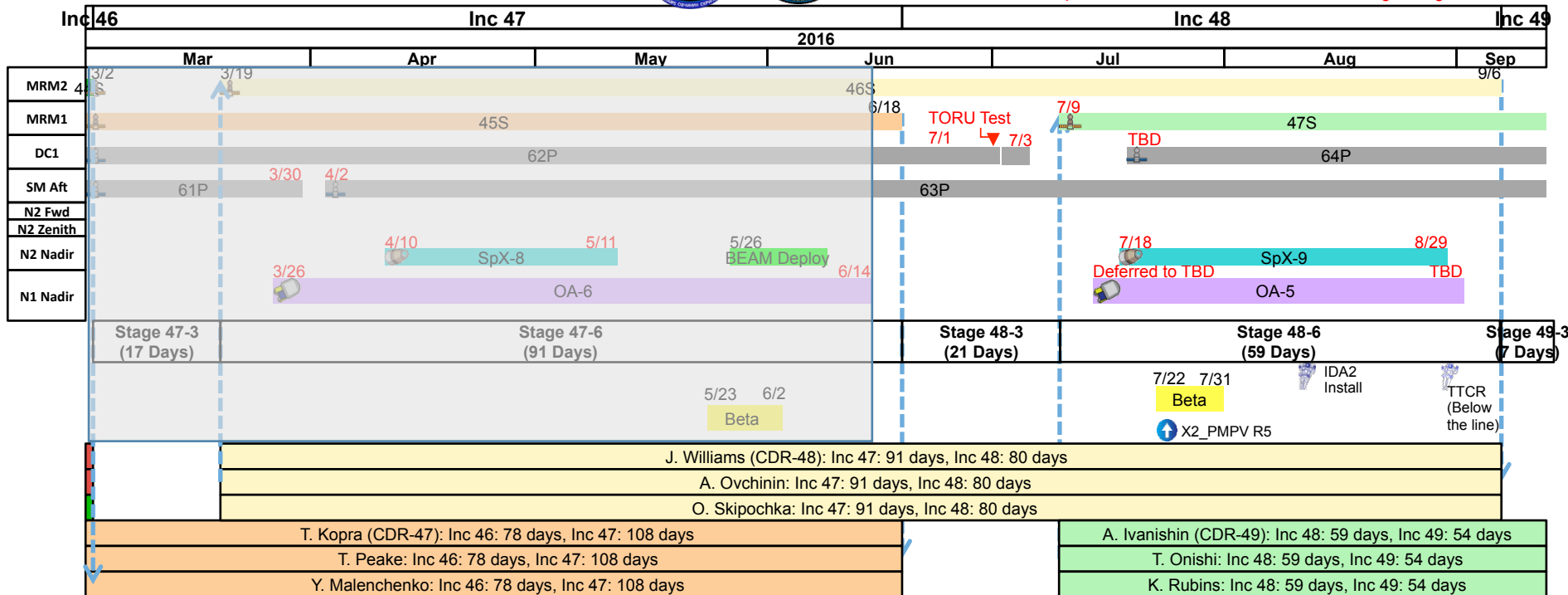
➤ Get Aheads

- Perform EHDC installation at CP09 ETVCG (IDA Install EVA, Only if no TTCR EVA)
- Perform EHDC installation on CP08 ETVCG
- PFCS MLI Removal (TTCR EVA only)
- Route White/Green Cable W2288 for IDA3
- Perform SSPTS cap removal.
- Connect MDM Ethernet cable
- EPIC MDM Ethernet Cable Route
- AMS Picture Task (TBD, IDA Install EVA only)
- Port CETA Cart Brake Handle Tieback

INCREMENTS 47 & 48



Updated 05/26/2016: All Dates GMT
SSCN/CR: 15088A, 15191, 15261, 15340, 15398 (in work)
Proposed dates in red under assessment in Flight Program CR



Highlights	Increment 47	Increment 48
Utilization	BEAM install, inflate, outfit (SpX-8)	Mouse Epigenetics-1 (SpX-9)
	RR-3 (SpX-8)	
EVAs, Resupply and Outfitting	OA-6 Post Unberth Activities:	IDA2 install
	- Saffire operations	TTCR EVA (Below the line)
S/W & Av Updates	- External NRCSD deployments (below ISS)	
	- REBR-W	X2 PMPVR5

45Soyuz Crew



Y. Malenchenko, T. Peake, T. Kopra

46Soyuz Crew



J. Williams, O. Skripochka, A. Ovchinin

47Soyuz Crew

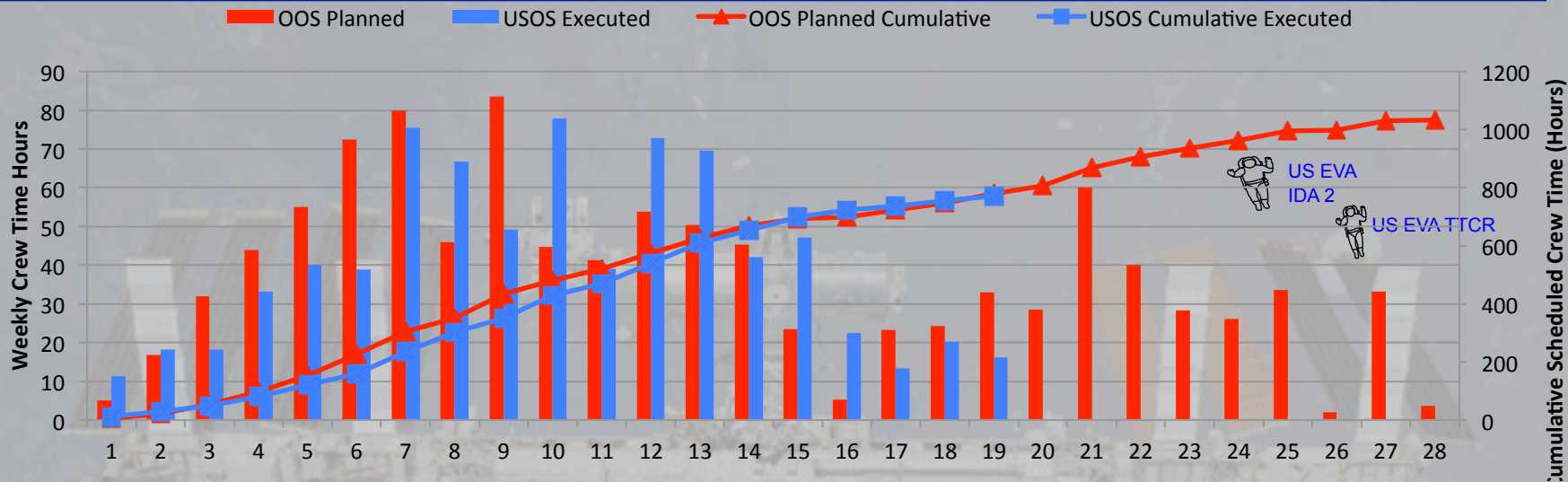


A. Ivanishin, K. Rubins, T. Onishi

IM - Hubert Brasseaux (x48079)
IDM - Jaime Marshik (x38796)
IE - Mark Stovall (x41752), Cindy Cranford (x47677)
IPE - Desiree Smith (x48218)



Inc 47 - 48 Utilization Crew Time



47-3	47-6			48-3	48-6		
47-3	47-6			48-3	48-6		
				Inc 48			
March	April	May	June		July	August	Sept

OA-6
Berth 3/13/16
Berth 3/26/16
Unberth 5/24/16
Unberth 6/14/16

SpX-8
Berth 3/22/16
Berth 4/10/16
Unberth 4/21/16
Unberth 5/11/16

SpX-9
Berth 5/9/16
Berth TBD
Unberth 6/8/16
Unberth TBD

OA-5
Berth 7/10/16
Berth August TBD
Unberth 8/29/16
Unberth August TBD

OA-4
46S
Undock
9/7/16

OA-3
Moved to 46S
Not planned in OOS

Wk15 data under review

Color Key:
Completed
Final OOS
FPIP Plan

Pre-Decisional, For
Internal
Use Only

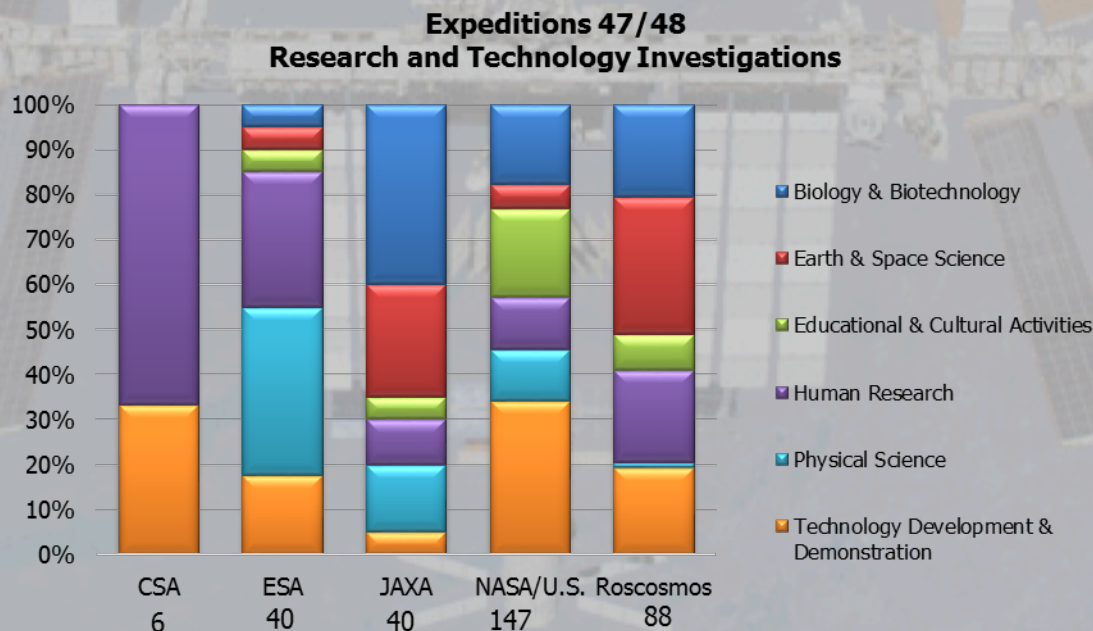
Executed through Increment Wk (WLP Week) 19 =	17.6 of 25.8 work weeks 68.22% through Increment
USOS IDR Allocation:	1,021.00 hours
OOS USOS Planned Total:	1,034.33 hours
USOS Actuals:	771.67 hours
	75.58% through IDR Allocation
	74.61% through OOS Planned Total
Total USOS Average Per Work Week:	43.84 hours/work week
Voluntary Science Totals to Date:	0 hours (Not included in the above totals or graph)
RSA/NASA Joint Utilization to Date:	32.5 Hours (not included in the above totals or graph)



ISS Research Statistics

Number of Investigations for 47/48: 321

- 147 NASA/U.S.-led investigations
 - 76 NASA/U.S.
 - 3 Roscosmos (Preliminary Data)
- 174 International-led investigations
 - 1 CSA
 - 14 ESA
 - 9 JAXA
- Over 800 Investigators represented
- Over 1300 scientific results publications (Exp 0 – present)



Estimated Number of Investigations Expedition 0-48: 2198*

Working data as of May 31, 2016

**Pending Post Increment Adjustments*



Increments 47 & 48 Research Plan - Investigation List



Human Research

Bone & Muscle Physiology

Bisphosphonates (Control),
Sprint, Marrow, Tbone (P),
Brain-DTI (P), CARTILAGE (P),
EDOS-2, Muscle Biopsy (P)

Cardiovascular & Respiratory Systems

Cardio Ox, Vascular Echo, Airway
Monitoring, IPVI↑

Crew Healthcare Systems

Skin-B

Habitability & Human Factors

Body Measures,
Fine Motor Skills, Habitability

Human Behavior & Performance

Cognition, At Home in Space, Circadian
Rhythms, Synergy (P)

Human Microbiome

Microbiome

Immune System

Salivary Markers, IMMUNO-2, Multi-Omics

Integrated Physiology & Nutrition

Biochem Profile, Telomeres (P), Repository,
Dose Tracker, Energy, MARES, Biological
Rhythms 48hrs

Nervous & Vestibular Systems

NeuroMapping, Field Test (P),
Space Headaches, Straight Ahead in
Microgravity (P)

Vision

Fluid Shifts, Ocular Health

Biology and Biotechnology

Animal Biology

Rodent Research-3
Space Pup ↓ Mouse Epigenetics-1

Cellular Biology

Micro 9, Micro 10, NanoRacks Mod-28,
Heart Cells*, WetLab-2, Stem Cells, Cell
Mechanosensing-3, Spheroids, Payload
Card-X

Macromolecular Crystal Growth

CASIS PCG 4, JAXA PCG Demo 2, JAXA PCG

Microbiology

Microbe-IV, Myco, BRIC-NP*,
BRIC -23*,
Microbial Observatory-1

Plant Biology

Auxin Transport
Plant RNA Regulation*, Veg-03,
NanoRacks Mod -33 (Agar),
Plant Gravi Sensing-3

Physical Sciences

Combustion Science

Cool Flame Investigation
(CFI), FLEX 2*

Complex Fluids

OASIS*, ACE H2*, ACE T-1
ACE T-9*

Materials Science

EML Batch - 1, MSL 2b, SODI DC Mix-
III*, Manufacturing Device, Synthetic
Muscle*, NanoRacks Module -40*, ELF
Batch #3,4

Fluid Physics

Marangoni-UVP, Two-Phase
Flow, PBRE*
Hard to Wet Surfaces*
Microchannel Diffusion

Fundamental Physics

DOSIS-3D, MagVector*

Earth & Space Science

Astrobiology/Astrophysics/Heliophysics

AMS-02 (E), Meteor, NanoRacks Mod-24*,
Solar-SOLACES/SOLSPEC (E), CALET (E)⁴,
MAXI(E)

Earth Remote Sensing

CATS (E), HICO-RAIDS (HREP) (E), ISS-RapidScat
(E), NREP Inserts

Near-Earth Space Environment

SEDA-AP (E), Ex-HAM #1 (E), #2 (E)

Technology Development and Demonstration

Characterizing Experiment Hardware

ESA-Haptics-1,-2*, ARTE (ASI), Biomolecular
Sequencer, NanoRacks Mod-29*, MVIS
Microcontroller -1, NanoRacks Black Box

Communications & Navigation

MobiPV*, METERON, Vessel ID System,
Maritime Awareness*, Scan Testbed

Fire Suppression and Detection

Saffire I/II

Multipurpose

Programmable Isolation Mount*

Repair and Fabrication

3D-Printer*

Power and Thermal Management Systems

Phase Change HX, Universal Battery Charger.

Radiation Measurements & Shielding

Area PADLES ↓ PS-TEPC ↑ Radi-N2, REM

Avionics & Software

SNFM, Telescience Resource Kit*
NanoRacks Module -63*

Life Support and Habitation

Mini Exercise Device-2, UBNT

Air, Water and Surface Sampling

Water Monitoring Suite, Personal CO2 Monitor*

Robotics & Imaging

HDEV (E), Gecko Gripper*, Robonaut, RRM
Phase 2 (E) JAXA HDTV

Spacecraft and Orbital Environments

Long Duration Sorbent
Test bed, Strata-1, REALM, SPHERES
Tether*, SPHERES Halo*

Space Structures and Materials

BEAM, Manufacturing Device, REBR-W

Small Satellites & Control Technologies

NanoRacks NRCS ext*, JSSODM-1, JSSOD#5,
EFU Adapter RTCMISS, SPHERES UDP*,
SPHERES SlosH*

Educational Activities

Educational Competitions

SPHERES-Zero-Robotics

Educational Demos

ESA-EPO-PEAKE, ISS Ham Radio, Story Time Demo*,
Tomatosphere*, JAXA EPO
Sally Ride EarthKAM

Student-Developed Investigations

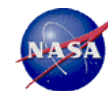
NR Modules-16, -18, -20, -21, -22, -51
NanoRacks Module-9, Mod-48*, Genes in Space*,
NanoRacks Modules* -41, -43, -44, -45, -46,-69

Classroom Versions of ISS Investigations

Windows on Earth

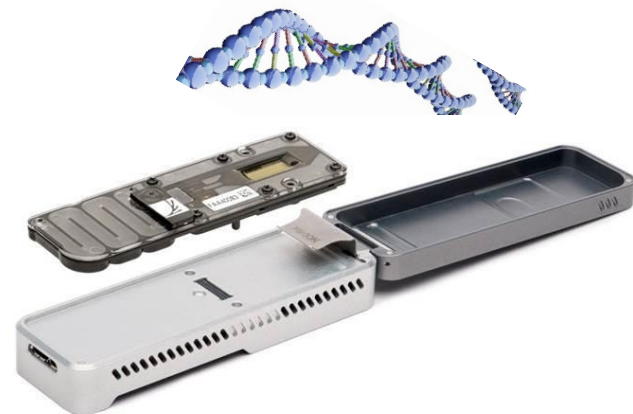


Featured Investigations: Technology Development and Demonstration



Biomolecule Sequencer

- The Biomolecule Sequencer investigation seeks to demonstrate, for the first time, that DNA sequencing is feasible in an orbiting spacecraft. A space-based DNA sequencer could identify microbes, diagnose diseases and understand crew member health, and potentially help detect DNA-based life elsewhere in the solar system.



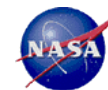
Phase Change HX

- The Phase Change Heat Exchanger Project seeks to advance the technology readiness level of phase change heat exchangers for infusion into future exploration vehicles. Phase change material heat exchangers are a useful technology that serve as a supplemental heat rejection device during time-varying heat loads and/or transient environments by storing waste energy by melting a phase change material during peak loads. It can then reject this energy through a radiator when conditions allow, causing the phase change material to freeze.





Molecules Produced in Microgravity from the Chernobyl Nuclear Accident



"Not only did these fungi thrive in the barren nuclear wasteland — they actually grew towards the radiation source."

"Melanin, the pigment that makes skin darker, is responsible for helping protect the fungi from harmful radiation and helps convert that radiation into a food source."

"We are sending these fungi to the space station because they are shown to produce special biological molecules that have potential to fight illnesses such as depression and cancer,"

Principal Investigator: Dr. Kasthuri Venkateswaran

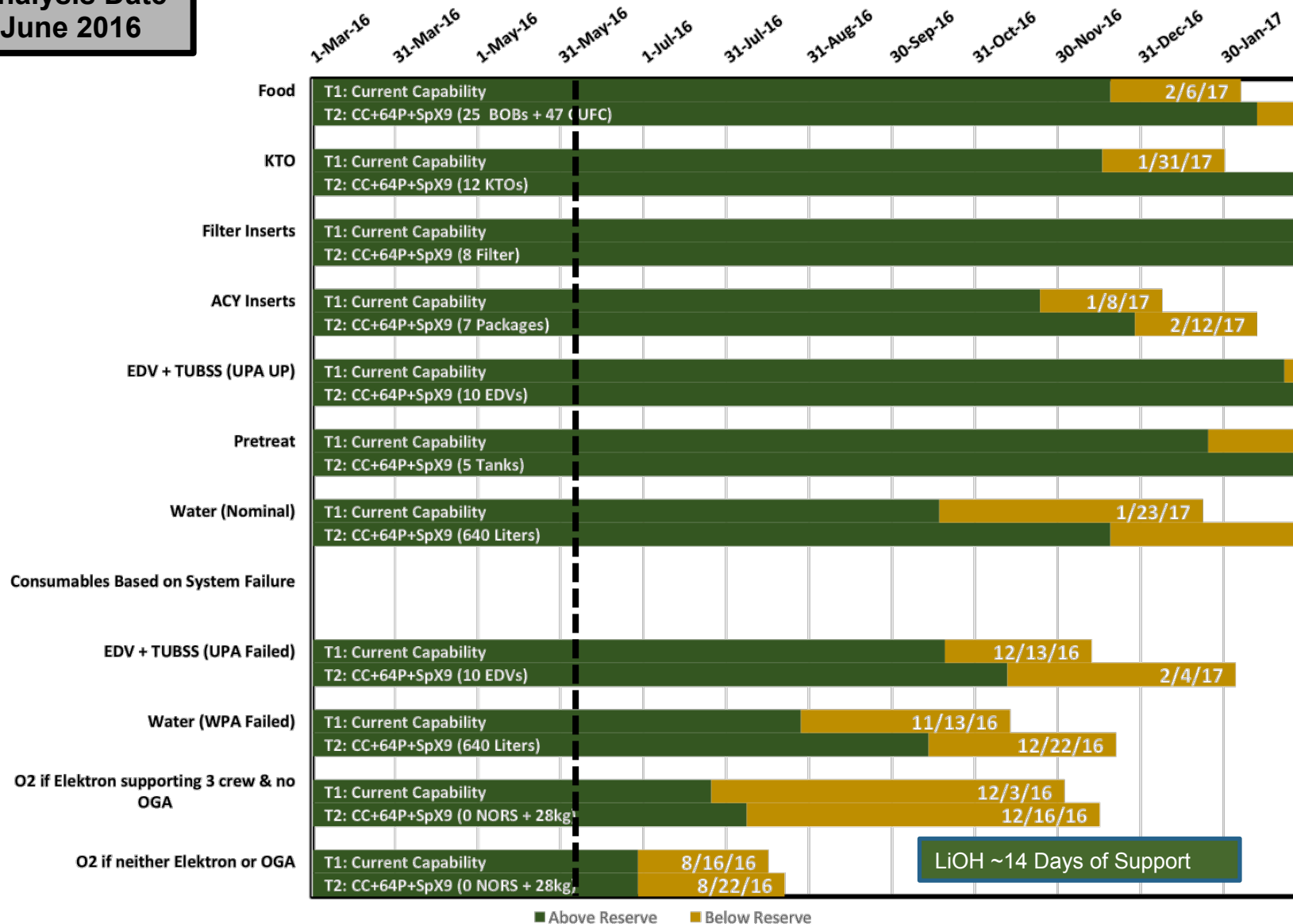
Partnership between JPL, Berkley Labs and CASIS

Affiliation: Jet Propulsion Laboratory/Caltech

Fungal strains isolated from the Chernobyl nuclear power plant accident will be screened for the secretion of natural products that could be beneficial for biomedical and agricultural applications. Since fungal strains isolated in and around the ChNPP produce agro- and pharma-related natural products on Earth, the NPμG team proposes to test the fungal cells under stressful microgravity conditions to measure whether they can produce novel secondary metabolites.

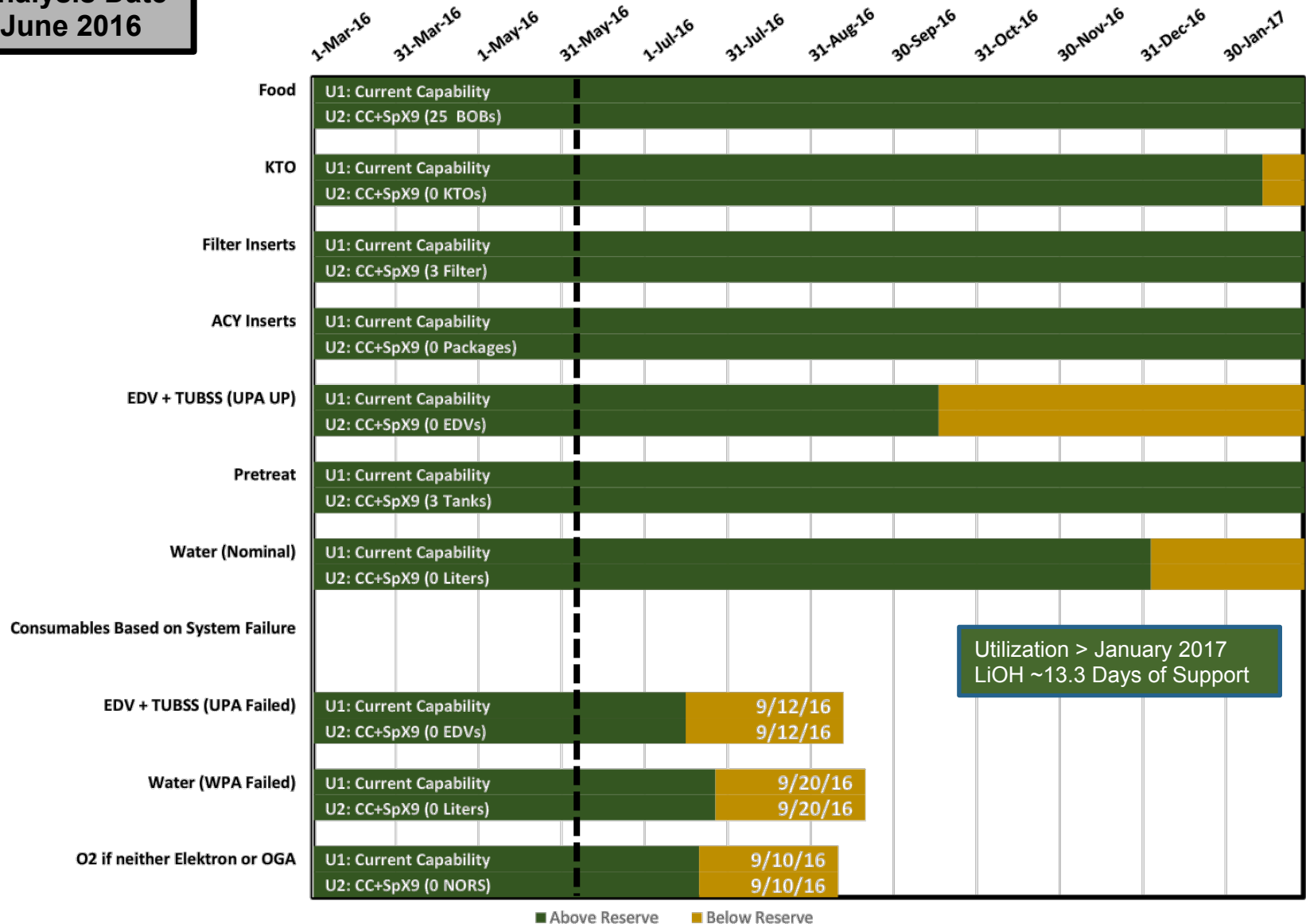
Analysis Date
3 June 2016

Total Consumables



Analysis Date
3 June 2016

USOS Consumables





Pertinent ISS Vehicle Issues

Issue	Impact to Stage Ops	Rationale
Inadvertent Soyuz 41S thruster firing	No	<p>On June 9, 2016 ISS experienced an unexpected torque (primary in the roll axis)</p> <ul style="list-style-type: none">• Torque was due to inadvertent firing of Soyuz 41S small thrusters• Fired Soyuz thrusters point towards the port side of ISS <p>Cause of thruster inadvertent firings:</p> <ul style="list-style-type: none">• Unexpected activation of 41S MCS after the end of the scheduled KURS in-loop test being conducted between 41S and FGB• Firings were due to a test script error
RPCM P12B_A extraction - high loads event	No	<p>On June 3, RPCM P12B_A experience higher loads than planned during SPDM extraction attempt.</p> <ul style="list-style-type: none">• Extraction was attempted without FMA enabled.• RPCM P12B_A R&R was aborted. RPCM was bolted and loads powered.• MART results (6/14).<ul style="list-style-type: none">• MSS loads violations are not expected to have caused damage to SPDM arm/OTCM or RMCT.• RPCM stress analysis shows negative margins for yielding and ultimate (plastic deformation). This is worst case – load path is difficult to determine.• Impact - R&R of this RPCM is required for the installation of the External High Definition Camera (EHDC) at the CP09 location (get ahead for IDA EVA).



Pertinent ISS Vehicle Issues

Issue	Impact to Stage Ops	Rationale
Inadvertent Progress thruster firing	No	<p>On June 1 during 62P re-docking test, after soft dock was achieved, the 62P vehicle initiated thruster firings while soft docked. Ground control issued commands to terminate thruster firing and docking was successfully completed.</p> <p>A Russian commission was formed immediately and determined that the vehicle software was not configured correctly. The vehicle though it was still free-flying and attempted to control attitude</p>
Water in EMU suit	No	<p>EVA 35 on Jan. 15, 2016, was terminated due to water in EV1's helmet (EMU 3011)</p> <ul style="list-style-type: none">• Estimates of total water was 50-250 cc, compared to 1000-1500 cc on EVA 23 <p>Extensive failure investigation is in work including TT&E for EMU 3011 that was returned on SpaceX 8 (May 2016)</p> <p>Cause of EVA 35 failure is still under investigation</p> <ul style="list-style-type: none">• Water in helmet may be a result of a number of contributors to system sublimator performance, not a single source (higher condensate load on the sublimator, water driven off METOX due to high heat load, blockage in 8 supplemental slurper holes, high latent load conditions, and condensation downstream of the sublimator)• Sublimator system and component performance is within specification for all ground testing



OA-6 Mission Success



➤ Mission Planning

- Successful unberth on 6/14/16 for a total of 80 days berthed
- Three experiments on-going post unberth; 8 days of data downlink
 - Spacecraft Fire Experiment (Saffire) #1 operations were successful with all data and video successfully downlinked
 - Four out of five NanoRacks cubesats deployed successfully
 - Re-Entry Breakup Recorder (REBR) data transmission was not successful (payload issue under investigation)
- Re-entry successful on 6/22/16 with successful Ames/SETI re-entry viewing efforts
- Post Flight Review (PFR) was completed on 6/20/16
- Lessons learned presented to ISS Program on 7/8/16

➤ **Pressurized Cargo** – 3519 kg

➤ **Unpressurized Cargo** – 83 kg

➤ **Disposal** - 1670 kg estimated



OA-6 Departure on 6/14/16





OA-5 Antares Return to Flight Mission



Antares Stage Test Complete 5/31/2016

Photo Credit: Orbital



OA-5 Mission Status



- **Mission Planning**
 - Mission Readiness Review (MRR) was conducted on 6/7/16
 - Cygnus Flight Readiness Certification Review (FRCR) was held on 6/8/16
 - Safety Review Panel (SRP) Ph 3 Pt 3 was held on 6/15/16
 - Antares FRCR is tentatively planned for 7/28/16
 - Stage Operations Readiness Review (SORR) is tentatively planned for 8/4/16
 - Flight Readiness Review (FRR) is tentatively planned for **8/11/16**
- **Pressurized Cargo** – 2400 kg planned; 1802 kg disposal estimated
 - Saffire #2 payload was integrated into Cygnus on 5/12/16
- **Unpressurized Cargo**
 - NanoRacks CubeSat Deploy (NRCSD) for deploy planned post unberth
- **Cygnus Status**
 - Cygnus SM and PCM were mated on 6/2/16
- **Antares Status**
 - Stage Test Article hot fire test was conducted on 5/31/16
 - Engine data review conducted during the week of 6/13/16
 - Launch Vehicle Assessment (LVA) is planned for 8/2/16
 - Mission Dress Rehearsal (MDR) is tentatively planned for 8/20/16





SpaceX-8 Mission Success

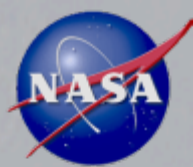


- **Mission Planning**
 - Successful return of vehicle cargo and science on 5/11/16
 - Preliminary Post Flight Review was conducted on 6/7/16
 - Lessons learned presented to ISS Program on 6/14/16
- **Pressurized Cargo** – 1710 kg; 1714 kg return estimated
 - **Launch:**
 - 1 Animal Enclosure Module-Transporter, 2 Polar, NORS O2 tank, and cold bags
 - **Return:**
 - 3 Polar, and 1 Short Extravehicular Mobility Unit (SEMU) and cold bags
- **Unpressurized Cargo** – 1552 kg
 - Bigelow Expandable Activity Module (BEAM) was expanded on 5/28/16 with ingress on 6/6/16





SpaceX-9 Mission Status



➤ Mission Planning

- Stage Operations Readiness Review (SORR) was held on 6/16/16
- SpX Launch Readiness Review (LRR) is planned for 7/16/16

➤ Pressurized Cargo – 1850 kg planned; 1750 kg return estimated

- Launch: JAXA Rodent Module (first flight), 4 Polars, Short Extravehicular Mobility Unit (SEMU), and cold bags
- Return: JAXA Rodent Module with live mice, 3 Polars, NORS O2 tanks, Short Extravehicular Mobility Unit (SEMU), and cold bags

➤ External Cargo – 500 kg

- International Docking Adapter (IDA) #2 was integrated to the trunk on 5/19/16

➤ Dragon Status

- Capsule was mated to the trunk on 5/31/16
- Initial cargo load was installed on 6/23/16 with late load planned for 7/17/16
- Mate to F9 is planned for 7/14/16

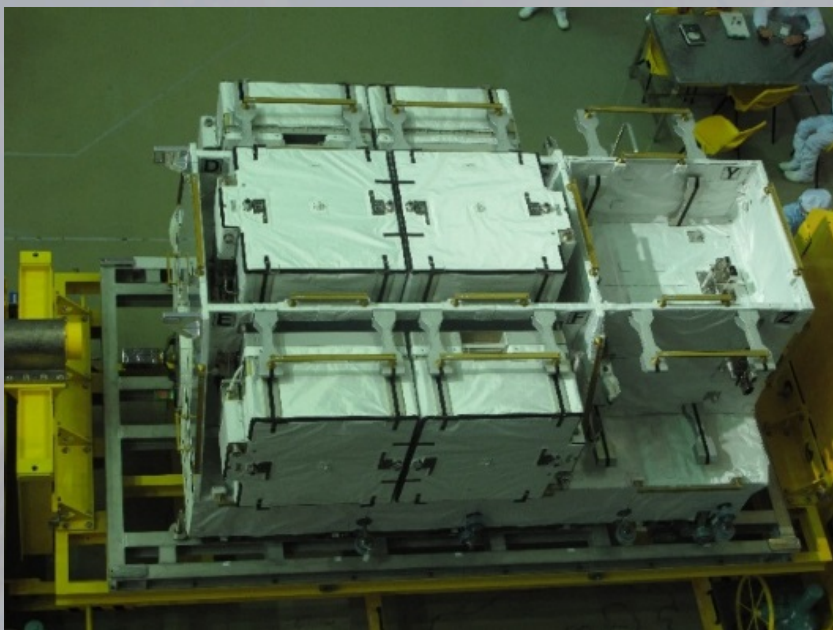
➤ Falcon 9 Status

- First and Second Stage completed ATPs in TX and arrived at the Cape on 6/21/16 and 6/23/16, respectively
- Stage Mate is planned for 7/13/16
- Static fire is planned for 7/16/16





HTV6 Mission Status



6 Batteries loaded on the Exposed Pallet (EP) and the Pallet loaded into the Unpressurized Logistics Carrier (ULC)



HTV6 Mission Status

➤ Mission Planning

- All modules have been shipped to TNSC, completion on 4/8/16
- HTV-6 JOP (face-to-face) in TKSC successfully completed the week of 5/23/16
- TDRS/Ground Segment End-to-End (ETE) checkout completed on 6/10/16
- Stage test dry run held from 6/24/16 – 7/12/16
- ISS Post Qualification Review is planned for 8/4/16

➤ Pressurized Cargo – planned 2848 kg upmass and 2040 kg disposal

- Rack internal cargo delivered to TNSC on 4/26/16
- Rack front cargo delivered to TNSC on 5/19/16
- Completed Pressurized Logistics Carrier (PLC) nominal cargo loading on 6/6/16

➤ External Cargo – planned 1400 kg and 1000 kg disposal

- External Pallet (EP) arrived at TNSC on 5/16/16
- Delta HTV/Exposed Pallet Phase III SRP completed on 6/1/16
- All Li-Ion batteries were installed to the Exposed Pallet as of 6/3/16 and charged as of 6/10/16
- EP installation to the Unpressurized Logistics Carrier (ULC) was completed on 6/16/16

➤ HTV Vehicle

- Carrier Assembly (ULC and PLC) integration from 6/23/16 – 7/6/16
- Flight Segment (ULC, PLC, AM, PM) Assembly completion is planned for 8/9/16
- Launch vehicle (H-IIB) handover is planned for 9/5/16 with fairing capsulation completed 9/9/16



International Space Station

SpaceX CRS-1 Cargo As of June 30, 2016



Mission	Previously Reported Launch Date/Window	Cargo Actuals		Comments
		Upmass (kg)	Return/ Disposal (kg)	
SpX-1	10/07/2012 (A)	450	846	Mission Completed
SpX-2	03/01/2013 (A)	865	1216	Mission Completed
SpX-3	04/18/2014 (A)	2116	1811	Mission Completed
SpX-4	09/21/2014 (A)	2338	1645	Mission Completed
SpX-5	01/10/2015 (A)	2394	1883	Mission Completed
SpX-6	04/27/2015 (A)	2024	1402	Mission Completed
SpX-7	6/28/2015 (A)	Lost	N/A	Mission Lost Due to Anomaly
SpX-8	04/08/2016	3262	#1714	Mission Completed
		13,449	#10,517	Cumulative Totals for Completed Missions
SpX-9	6/18/2016 (A)	~2,300	TBD	Pressurized Cargo; External Cargo Planned; IDA2
SpX-10	*NET 8/01/2016			Pressurized Cargo; External Cargo Planned; STP-H5, SAGE-III, SAGE NVP
SpX-11	*08/15/2016-09/13/2016			Pressurized Cargo; External Cargo Planned; NICER, MUSES, ROSA
SpX-12	*12/15/2016-01/13/2017			Pressurized Cargo; External Cargo Planned; CREAM
SpX-13	*02/13/2017-03/14/2017			Contract extension Mission; Pressurized Cargo; ASIM, TSIS, MISSE
SpX-14	*04/08/2017-07/06/2017			Contract extension Mission; Pressurized Cargo; RRM3, PFCS, SDS
SpX-15	*08/01/2017-10/29/2017			Contract extension Mission; Pressurized Cargo; ECOSTRESS

* Under Assessment - The overall flight schedule for ISS is currently being re-assessed to align with Program Requirements

Final mass reconciliation in process.



International Space Station

SpaceX CRS-1 Cargo As of June 30, 2016



Mission	Actual Launch Date (A) or Current Launch Date/ Window	Cargo ⁽²⁾ Actuals		Comments
		Upmass (kg)	Return/ Disposal (kg)	
SpX-16	06/02/2018-08/30/2018			Contract extension Mission; Pressurized Cargo; IDA3; L-18 mo. establishes the 90 day launch window.
SpX-17				
SpX-18				
SpX-19				
SpX-20				

* Under Assessment - The overall flight schedule for ISS is currently being re-assessed to align with Program Requirements

Final mass reconciliation in process.



International Space Station

Orbital ATK CRS-1 Cargo As of June 30, 2016



Mission	Actual Launch Date (A) or Current Launch Window	Cargo ⁽²⁾ Actuals		Comments
		Upmass (kg)	Return/ Disposal (kg)	
Orb-1	01/09/2014 (A)	1462	1466	Mission Completed
Orb-2	07/13/2014 (A)	1664	1741	Mission Completed
Orb-3	10/28/2014 (A)	Lost	N/A	Mission Lost Due to Anomaly
OA-4	12/06/2015 (A)	3513	1411	First mission with longer pressurized cargo module (PCM); Atlas V401 planned launch vehicle;
OA-6	03/22/2016 (A)	3602	#1670	Saffire #1 payload; Atlas V401 planned launch vehicle; NanoRacks CubeSat Deployers (83kg)
		10,241	#6,288	Cumulative Totals for Completed Missions
OA-5	NET 08/2016			Saffire #2 payload; Antares 230 with RD181 engines planned launch vehicle.; NanoRacks CubeSat Deployers.
OA-7	12/01/2016-12/30/2016			Saffire #3 payload; Antares 230 with RD181 engines planned launch vehicle. Two powered Middeck Lockers
OA-8	06/07/2017-07/06/2017			Contract extension mission; Antares 230 with RD181 engines planned launch vehicle; Two powered Middeck Lockers
OA-9	*12/2017			Contract extension mission; Antares 230 with RD181 engines planned launch vehicle; Two powered Middeck Lockers; L-18 mo. establishes the 90 day launch window
OA-10	*06/2018			Contract extension Mission; Antares 230 with RD181 engines planned launch vehicle; Two powered Middeck Lockers; L-18 mo. establishes the 90 day launch window.
OA-11	*12/2018			Contract extension Mission; Antares 230 with RD181 engines planned launch vehicle; Two powered Middeck Lockers; L-18 mo. establishes the 90 day launch window.

* Under Assessment - The overall flight schedule for ISS is currently being re-assessed to align with Program Requirements

Final mass reconciliation in process.



Commercial Resupply Services CRS-2 Integration



- CRS-2 Contract award was announced on Jan. 14, 2016
 - Awardees are Orbital-ATK Inc. (OA), Sierra Nevada Corporation (SNC) and SpaceX (SpX)
 - Contractor post award briefings were completed in April 2016
 - ISS Integration work has been ordered for each provider as of 6/3/16
 - SNC held it's Integration Review (IR) #1 on 6/8/16 with IR #2 planned for 7/20/16
 - OA IR #1 was completed on 6/21/16 with IR #2 completed on 7/7/16
 - SpX IR #1 is scheduled for 7/27/16 with IR #2 planned for Sep (date to be set at IR#1)
 - A minimum of six missions will be ordered from each provider
 - CRS-2 missions are planned for launch in 2019



ISS Integration Status of Crew Vehicles



- Mission Planning
 - Supported the mass reduction efforts for CST-100
 - Inc 51/52 kickoff in work for upcoming demonstration mission
 - Coordinating cargo planning for the demonstration missions
 - Define dates for data exchanges with the International Partners
 - Detailed the ISS Surveillance activities and working to integrate within CCP plan
- ISS On-orbit Readiness
 - Common Communications for Visiting Vehicles (C2V2) on-orbit checkout completed in May 2016; initial joint testing conducted with SpaceX Crew Dragon in June was successful
 - International Docking Adapter (IDA-2) installation planned with SpX-9 mission in July 2016
- Joint Integration Activities
 - Early joint interface test and analysis activities have commenced
 - Verifications are being now being submitted for ISS interface requirements



ISS Research and Development Conference

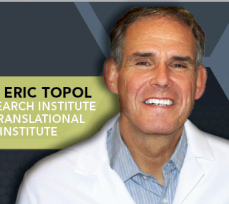
San Diego, California July 12-14, 2016



Announcing 2016 Keynote Speaker:

DR. ERIC
TOPOL

ERIC TOPOL
SCRIPPS RESEARCH INSTITUTE
& SCRIPPS TRANSLATIONAL
SCIENCE INSTITUTE



Discussed medical technology advancements
with Dr. Ellen Stofan and implication for astronaut health

Announcing ISS R&D Panel Discussion with:

DR. SANJAY GUPTA
CNN CHIEF MEDICAL CORRESPONDENT

JOINED BY

SCOTT & MARK KELLY
FORMER NASA ASTRONAUTS



Discussed 1 year crew and twins research
And implications for Journey to Mars

Announcing 2016 Keynote Speaker:

DR. PETER
DIAMANDIS

DR. PETER DIAMANDIS
EXECUTIVE CHAIRMAN,
XPRIZE FOUNDATION
CO-FOUNDER/CO-CHAIRMAN,
PLANETARY RESOURCES



Discussed advancements in technology applications
for space and the broader technology industry

Other highlights:

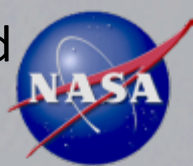
714 registered participants
(increase of about 20 over last year)

Workshops targeted for new users

Forums for linking together investors
with emerging companies



Advancing Economic Development in LEO via Commercial Use of Limited Availability, Unique International Space Station Capabilities RFI



NASA is investigating options and approaches to expedite commercial activity in Low Earth Orbit (LEO).

Specifically, NASA is looking to increase private sector demand for space research and expand on the work of Center for the Advancement of Science in Space (CASIS), the manager of the ISS National Laboratory.

NASA is not only interested in technical solutions to advance these goals, but also in contract or agreement structures that potential offers' would see as beneficial to advance private sector demand for low Earth orbit research.

Some unique capabilities that could be made available include:

- Currently available
 - Common Berthing Mechanism ports, if the user provides equivalent capability to maintain ISS functionality
 - Trunnion Pins
 - Other unique interfaces or capabilities of the ISS as suggested by the offeror
- Available in the future
 - Common Berthing Mechanism attachment site at Node 3 Aft

RFI was released on July 1 – Responses are due July 29, 2016



Successful deployment of BEAM on May 26, 2016

